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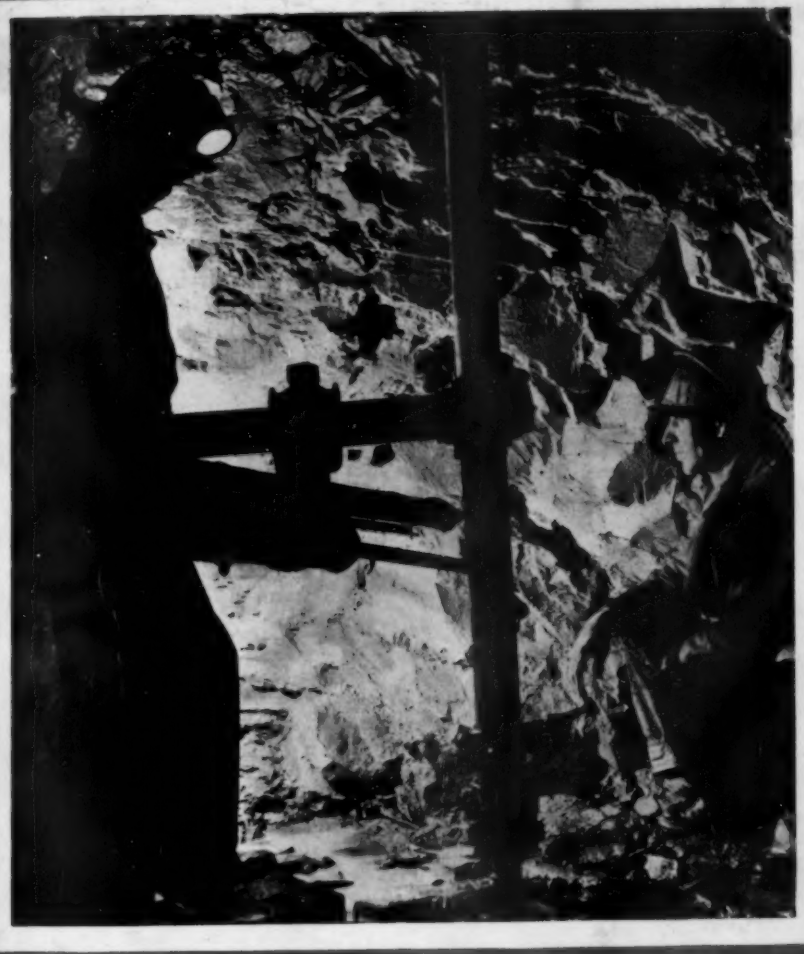
# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



April 24, 1937

## Mystery Mine

See Page 260

A SCIENCE SERVICE PUBLICATION

# SCIENCE NEWS LETTER

*Vol. XXXI* *No. 837*

The Weekly Summary of

Current Science

*Published Every Saturday by*

SCIENCE SERVICE

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*Edited by* WATSON DAVIS

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# DO YOU KNOW?

Foxes are good mousers.

"Dry ice" is proving useful in fighting forest fires.

Henry Ford's first patent, in 1898, was for a carburetor.

Heat waves are blamed for more illness and death than are cold waves.

About 30 per cent. of the cloth used in India is still made on hand looms.

Ten different forms of vitamin D, as it occurs in various animal and plant sources, have been determined.

Skylights are being made in Italy of two layers of glass with a layer of glass wool between, to keep out heat from the sun.

Providing radio programs that will appeal to both Englishmen and African natives is a problem of radio broadcasting in South Africa.

An electric device which locates broken needles in rugs is useful to rug makers, because needles sometimes break and finding them embedded in the fabric is a slow and tedious task.

Gourds can be made to take fantastic shapes by tying bandages on them while they are growing.

Village weaver-birds in West Africa build their hanging nests in communities of as many as 100 nests.

A laboratory in a trailer is being used by government scientists to study insect pests in southern peach orchards.

A long air route is planned to link fishing, mining and other industrial centers of northern Russia and Siberia.

In the evolution of the automobile to its present state, over 100,000 original ideas have been patented in the United States.

The word type-writer was coined by the inventor Christopher Sholes, who patented a practical typewriting machine in 1867.

After frying potato chips in nine kinds of fats, government scientists found that oils are better than lards for this purpose.

By giving cotton fields a winter overcoat, consisting of a cover crop of legumes, southern growers are boosting their cotton yield.

## WITH THE SCIENCES THIS WEEK

*Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.*

ANTHROPOLOGY

Does the marriage of close relatives lend to degeneracy? p. 268.

ASTRONOMY

What important observations will be made when Mercury skims along the edge of the sun? p. 266.

CHEMISTRY

Is the element potassium connected with growth of cancer? p. 259.

What is epiallopregnanolone? p. 262.

What vitamin may be shaken from the salt cellar? p. 263.

Why should fish be cooked in different ways at different seasons? p. 263.

DENTISTRY

Do boys have as much toothache as girls? p. 265.

ENGINEERING

What mine is being dug with no interest in the ore? p. 260.

ETHNOLOGY

Can Indians read beads? p. 264.

HYGIENE

What should you do for spring fever? p. 269.

MEDICINE

What is the best weapon against pneumonia? p. 264.

PALEOBOTANY

Have fossils been formed since 1912? p. 265.

PSYCHOLOGY

Can a chimpanzee learn to save his "money"? p. 270.

Do political and economic conditions affect the sanity of men? p. 269.

PUBLIC HEALTH

What city does most to promote health in its inhabitants? p. 264.

VITAL STATISTICS

Is motherhood becoming safer? p. 264.

CHEMISTRY

# Life in Plants and Animals May Exist Because of K41

## Rare Isotopes Liberate in Human Flesh Energy in Form of Beta and Gamma Rays; Speed Seed Germination

K41 MAY be the reason your heart beats and you are alive today. This cryptic symbol, resembling the code signature of a wartime spy, is the chemist's designation of a variety, or isotope, of the element potassium. And it is already known that if this metallic element is removed from the blood stream the heart will stop beating.

Potassium is doubtless the most interesting of the metallic elements necessary to sustain life. This is true, not only because of all the vital elements potassium alone is radioactive, but because the potassium content of the organism is so closely associated with the development of embryonic tissue. The high potassium content in the blood and bone marrow of animals suffering from carcinoma has recently added interest to this element.

Organized potassium is now known to be made up of three parts, differing by units of one in mass—K39, K40, K41. A vastly more interesting difference, however, is that the rare isotopes K40 and possibly K41 emit two hard beta or negatively charged rays, and one gamma or X-ray.

### 225 Atoms

While the total amount of energy from these rays is small, it is interesting to note that in every gram of potassium in the human body—about one three-hundredth of an ounce—there are 225 atoms disintegrating each second. The amount of energy liberated in a gram of flesh in a second, due to the potassium present, is 500 times that necessary for the eye to see, were this energy in the form of green light. Whether these beta rays are in any manner associated with the life-giving properties of potassium is an interesting but little understood question.

At the meeting of the American Chemical Society in Chapel Hill, N. C., Dr. A. Keith Brewer of the U. S. Bureau of Chemistry and Soils in Washington described new research on the atomic weight of potassium in animal tissue which is another step forward in determining potassium's role in life.

Dr. Brewer has determined the ratio of the two forms of potassium called K39 and K41 in plants, minerals and a large number of animals; also in fast-growing embryonic tissue, in bone marrow and other body tissues including the heart.

The fundamental importance of studying the role of potassium in living things can better be appreciated by recalling that the German scientist Zwaardemaker found the removal of potassium from the blood stream would stop the heart beat. Moreover, he found that if radioactive material were substituted for potassium in the blood, the heart would again start to beat. Also he found that if the heart were merely radiated by radioactive material it would start to beat. This finding was substantiated by Dr. Jacques Loeb of the Rockefeller Institute for Medical Research, but it was also found that the metallic element caesium would similarly start the heart to beat. This seemed to be the only exception to the general rule that radioactivity could equal the element potassium in causing heart beats.

### Life-Giving?

The next step was the speculation—and admittedly it still is such—that perhaps it was the radioactive kind of potassium, the K41 form, which was the crucial factor, the life-giving role of this element.

Moreover, and lending weight to speculation that radioactive potassium was

*MARIGOLD LOSES ODOR*

***To many the odor of marigold stems and leaves is disagreeable. Now a new hybrid variety has been originated that has no foliage scent at all. Its flowers are sweet-scented —their perfume resembles that of honeysuckle. To secure it, an odorless dwarf marigold found in Tibet was crossed with larger and showier kinds already in cultivation. David Burpee, plant breeder, is here testing the scent of a handful of flower-heads with an osmoscope.***

important to life, experiments at Prague had shown that seed germination was markedly speeded by the presence of K 41. In seeds where perhaps 20 out of a hundred would germinate naturally, the number was increased clearly beyond any experimental error in the presence of radioactive potassium.

Dr. Brewer's report to the chemists indicates that a high proportion of the radioactive kind of potassium appears to be associated in animals with embryonic tissue. Bone marrow, for example, is rich in K 41 compared with other tissues of the body, and the concentration grows less with the maturity of the animal. Interesting too is the fact that a mature animal which had developed cancer and therefore had more than normal abundance of embryonic tissues in its body showed an increase in the K 41 content, of its tissues.

The heart, he reported, is relatively low in its K 41 content and has relatively more of the non-radioactive K 39 kind of potassium present.

Dr. Brewer's studies were made with the aid of a large atom "scale" known technically as a mass spectograph which determines the weights of the atoms in an element.

His present studies on animal tissues are the culmination of a similar line of research on potassium which has included the analysis of seawater for the element, down to a depth of two and one half miles; a study of the ratio of the two kinds of potassium in minerals from all over the world and an investigation of the same thing in plants.

The ratio of the two varieties, and hence the average atomic weight, is sensibly constant, Dr. Brewer told the writer, in seawater and in minerals. Constant it is too in plants with the exception of kelp which seems to have the ability to concentrate the radioactive form, and in potato vines where the older vines show more of K 41 than do the younger ones.

*Science News Letter, April 24, 1937*

**SETTING THE BLAST**

***Experimental test adit of the U. S. Bureau of Mines at Mt. Weather, Va. Wing G. Agnew, resident engineer, left, tamps dynamite into drill holes with his wooden pole and the miner prepares to hand him the primer stick with its wires and detonating caps. The box of dynamite can be seen in the foreground.***

ENGINEERING

# Mystery Mine in Blue Ridge Revealed as U. S. Test Tunnel

## Tunnel of 175 Feet Into Mountain Will Be the Proving Ground for Bureau of Mines Experiments

By ROBERT D. POTTER

**See Front Cover**

INHABITANTS of the Virginia town of Bluemont, neighboring farmers and hilldwellers on the nearby Blue Ridge mountain range have a new mystery to supplant a local murder of some months back. They have been watching strange out of state automobiles, and trucks with little-seen government license plates, take men and machines into the gravel ridge road that meanders some five miles off the main highway and finally reaches Mt. Weather.

These men and their equipment, they know, are for a mine that has been pushed by drilling and blasting through the hard Blue Ridge rock all winter. The local mystery comes in the supposed purpose of the mine; a purpose which in local rumor circles runs all the way from gold mining to the search for some nameless blue-green mineral highly useful for Navy battleships in a way which no one will venture to explain.

On the trail of this Blue Ridge mine mystery, Science Service photographer Fremont Davis and the writer bounced over the twisting ridge road until the U. S. Weather Bureau's abandoned kite-station at Mt. Weather was reached. Still no mine. The caretaker, however, pointed to a still more torturous road carved through rock and between giant trees on a timbered ridge. Fifty feet down that road we stopped and backed up in haste to a safe place and went ahead on foot. Finally, down the slope perhaps a quarter mile, we came to the local "mystery" mine.

From deep under our feet we could hear a pneumatic drill battering the hard rock. The exhaust of the motor-driven air compressor was the only other sound in the quiet mountains. The mine, we knew, was the test adit of the U. S. Bureau of Mines, so we searched out the genial resident engineer, Wing G. Agnew.

"Why was the mine? Where was it going? What for? How deep was the tunnel into the mountain side?" The questions poured out as Mr. Agnew grinned and settled back with his cigar in his old farmhouse office.

### Mine For Tests Only

"Pick yourself one of these 'hard' miner's hats and come on down into the adit," replied Mr. Agnew. Adit, it should be explained for those who are neither miners nor cross-word puzzle fans, is a nearly horizontal entrance to a mine open only at one end, whereas a tunnel has both ends open.

The mine, he explained as we walked down the hillside to the entrance, is truly a test mine where the Bureau of Mines can have command of all controllable conditions in experiments on the efficiency of drill bits, dust production and its relation to the silicosis problem, the efficiency of different kinds of dynamite and blasting agents, mine ventilation and other problems.

But because it is a test mine, it creates the local mystery. To the layman it seems senseless to mine without mining anything, not to care too much where the mine is going, or how fast it goes there.

The Bureau of Mines, pointed out Mr. Agnew, could perform some of its tests in commercial operating mines by arrangement with the owners. But such

work would have to be done at odd times to avoid conflict with the operations and in many cases it would not be possible to juggle conditions through a wide range needed for a particular experiment. As every scientist knows, without control of all possible factors an experiment only gives a qualitative hint rather than a positive quantitative answer. Moreover if an experiment is done in a private mine the information becomes the property of that mine and may not be released to the mining industry as a whole.

### 175 Feet Into Mountain

The Bureau's Mt. Weather mine, in effect, is a proving ground where any sort of mining test that needs to be made can be carried out. As resident engineer, Mr. Agnew's task is to get the mine into the toughest rock he can find that will, at the same time, be of consistent uniformity. He will then cooperate with the various divisions of the Bureau of Mines in any tests they may wish to make. The geologically ancient basalt rocks of the Blue Ridge seem almost ideal for this purpose.

With the shaft now 175 feet into the mountain Mr. Agnew chuckles at the slow progress, for he knows that his searched-for "tough" rock is at hand. Thus a problem that would cause gray hairs in the head of an engineer of a commercial mine, brings delight on Mt. Weather. As an ex-small boy who liked to dig caves in a convenient bank of clay down by the creek, the writer could not help envying Mr. Agnew his job of digging.

Blinded at first by the darkness and deafened by the roar of the drill biting at the rock face at the far end of the tunnel, we stumbled along the little handcar track into the mine. Shortly the dim lamps of the miners' caps glowed through the misty, fog-like haze of the pneumatic drill's exhaust. The roar of the drill forbade all attempts to speak.

### Pneumatic Hammer Used

The beam of a flashlight showed the blue-green rock in the face of the adit. One could see the cannon-like pneumatic hammer aimed at a hole near the floor. Into the hole stuck the vibrating drill rod that 2,000 times each minute battered the rock and at the same time slightly twisted the drill bit. From the hole poured a small stream of muddy water whose source was the end of the drill where a jet of water issued to lay the rock dust.

We were fortunate, for the last of 18 holes in the face was nearly finished and the next step of filling the holes with dynamite and clay was about to begin. Then would come the hollow-sounding blast that would strip another five feet out of the hard rock face and make a day's work of cleaning up by mucking.

In the tremendous roar of drilling, action pictures were obtained and then we gladly retreated to the mouth of the mine to learn what it was all about.

While Mr. Agnew nonchalantly sat on a rock and slit the sides of wrappers of dynamite sticks, we asked more questions. We found that the slits were to allow the dynamite to spread throughout the drillholes when the explosive was tamped into place. Those sticks with the wires running from one end were the primers containing special gelatine dynamite and detonating caps that would set off the blast. The little tags 0, 1 and 2 on the primers indicated delayed action blasts. The "zero" sticks explode first, followed by those numbered 1 and 2 a fraction of a second later.

### Blast At Center

The trick of mine blasting, explained Mr. Agnew, is to set a heavy charge of "zero" sticks in the center of the face which explode as soon as the electrical igniting circuit is closed. Almost immediately, however, the "1" sticks explode and with the center of the face partially freed have most of their driving force also toward the center. Finally the weaker charges at the edges of the face, plus an extra heavy charge along the bottom, explode and add their force to the blast. This last blast picks the rock up and deposits it on pieces of sheet steel that temporarily form the floor of the shaft and make the clean-up removal of the rock much easier.

Because he has only local labor, Mr. Agnew himself fills and tamps in all the drill holes and sets off the electrical circuit for the blast. After watching him take a long wooden pole and tamp the dynamite in place we were glad to withdraw again to the mouth of the mine. To a layman watching a mining engineer "tamp" the dynamite, the verb "pound" seems more applicable.

From the face of the mine the distant entrance is only a small spot of light in a world of darkness. It seems inconceivable that any rock can be hurled horizontally for that distance and by bouncing off the walls finally gain the entrance. But that is exactly what happened in the blast.

### Rock Hurled Out

First came the hollow sound of the explosion and your eardrums and even

*DIGGING THE MUCK*

***The debris of rock after an experimental blast which, in this instance, hurled rock to the entrance of the adit some 175 feet away.***

your body felt the impact of the rushing air. Almost at the same time came the cloud of gases and the swirl of leaves swept up by the rushing man-made wind. And then a piece of rock some 15 inches long bounced out ten feet beyond the mouth of the mine.

It takes an hour to clear the mine of vapors and dust and then again we venture back. The going is now even harder than before, for rocks and fragments are splattered down the whole adit.

Ultimately, with skinned shins and scarred shoes, you reach the former face. And there is a pile of rock half as high as a man and beyond it a hollowed-out place. The steel flooring, at least on this particular blast, will be of little use, for instead of being under that pile of rock it has been blown back some 20 feet down the shaft. More pictures are taken, and then the miners come in to start the tedious task of cleaning up for the next drilling and blast.

*Science News Letter, April 24, 1937*

METEOROLOGY

## South Polar Weather Data To Be Published

WEATHER figures and facts amassed during Admiral Byrd's South Polar expedition are now being digested and arranged for publication at the U. S. Weather Bureau, by Meteorologist George Grimminger, who was with Admiral Byrd in Antarctica.

Mr. Grimminger is being aided by six Works Progress Administration employes. The project will require eight months for its completion, and will involve an expenditure of $4,500. A formidable amount of reducing, correcting, evaluating, and editing is involved before the work will be ready for the printer. Scientific publication is expected early in 1938.

The report, when finally published, will be unique. It will be not only the first meteorological report ever published by the U. S. Government on the South Polar regions but also the first ever published by any country to include observations made in the upper air over Antarctica by means of balloons, kites and airplanes. No previous Antarctic expedition was equipped to take these observations of air movements and other data concerning the South Polar air currents which breed much of the world's weather.

The data were obtained in temperatures ranging from freezing to 72 degrees below zero.

*Science News Letter, April 24, 1937*

CHEMISTRY

# Major Forward Step Made Toward Chlorophyll Synthesis

### Chemistry Meeting Hears Also of New Solvent, New Male Sex Hormone, and Powerful Local Anesthetic

A MAJOR forward step toward the chemical synthesis of chlorophyll, the green coloring matter of plant leaves upon which depends nearly all life on earth, was disclosed to the Chapel Hill meeting of the American Chemical Society.

About 70 compounds closely related to chlorophyll have been prepared and some of them have strange and powerful physiological properties. One compound, for example, was injected into rats in small amounts of 10 milligrams and virtually bound the animals to a life in darkness in order to live. As long as they remained in the dark they showed no effect. When removed to daylight they died in a few hours.

Dr. Paul Rothemund of Antioch College, in describing his researches on these chemical relatives of chlorophyll, also told of a German chemist who tried some of the substance on himself with the result that he too, was bound to a life "after dark." For ten months he could not go out into the light without having his face swell up, suffering intense pain, and having patches of his hair fall out.

While none of Prof. Rothemund's products are identical with those found in nature he believes that he or someone else will produce eventually a substance indistinguishable from the natural product.

Funds from the National Research Council, the Chemical Foundation and drug manufacturing companies have supported the Antioch researches.

#### Powerful Solvent

A new world of chemical research was thrown open before the meeting with a description of a chemical solvent that makes possible a whole new series of chemical reactions. In the new solvent water, usually considered a neutral compound, forms a base and reacts with acids to form new chemicals.

Reporting five years of study of the solvent, known as selenium oxychloride, Prof. Gilbert B. L. Smith of Brooklyn Polytechnic Institute said, "Such strange things happen to substances dissolved in this solvent that chemists must revise their theories of ionization as applied to acids, bases and salts."

Selenium oxychloride is a heavy straw-colored liquid that freezes at about 65 degrees Fahrenheit. It has a corrosive action on many common materials.

Describing its oxidizing properties, Prof. Smith said: "Once some of it froze over night, broke its containers and dripped on the wooden floor of one of the laboratories at the Institute. It ate right through the floor and dripped down into the physics laboratory below. The selenium oxychloride destroyed several instruments in the physics laboratory and even attacked bakelite fixtures."

To picture to his audience the strange properties of selenium oxychloride, Prof. Smith envisioned the world as it might be if the solvent were as prevalent as water and stood in the latter's place as the widest known solvent.

Mountains, said Prof. Smith, would consist only of glass or feldspar, two of the few substances which the solvent will not dissolve. All bridges and boats would have to be constructed of platinum or tungsten.

From the time the temperature went below 65 degrees in the fall the whole world would be a great frozen mass. Snow would fall every time it became colder than mild springtime and when it rained man would have to carry umbrellas made of glass, tungsten or platinum.

#### New Male Sex Hormone

A new male sex hormone known as epiallopregnanolone has now been isolated and made synthetically, it was announced by Dr. R. E. Marker of Pennsylvania State College on behalf of his colleagues, R. V. McGrew, E. L. Wittle and D. M. Jones.

In most minute amounts this hormone aids the development of male sex characteristics in birds and other animals, including humans. Its source was the urine of expectant mothers.

Two other male sex hormones have previously been obtained, testosterone from the sex glands, and androsterone.

The sex hormones, Dr. Marker believes, do not act primarily as physical stimulators of specific organs but rather by chemical combination in the body.

This supposition is strengthened by evidence showing that when the sex hormones are administered they cannot be recovered in their original form. They are recovered as decomposition products, showing that they have entered into chemical combination in the body.

### Vitamin in Salt

Table salt rich in vitamin B is now a distinct possibility, Prof. L. R. Cerecedo of Fordham University reported.

Among the four more important vitamins, A, B, C, and D, vitamin B is most lacking in modern diets.

Prof. Cerecedo has found that synthetic sand-like materials, of the general nature of the zeolites used as water softeners, have the ability to take up vitamin B from cereal and yeast extracts.

These synthetic vitamin sponges retain the vitamin until they are treated with salt solution when they transfer the vitamin to it. After evaporation of the water a residue rich in vitamin B is obtained.

The amount of vitamin B in the amount of salt ordinarily shaken on food at the table would be more than sufficient to supply that which is known to be lost in the cooking because of heat and water extraction. It appears probable that the amount of vitamin B which could be obtained from the daily sprinklings of salt would equal the vitamin obtained by eating three yeast cakes.

### Local Anesthetic Reported

A local anesthetic 10 to 15 times as powerful as procaine or cocaine was reported to the meeting by Dr. Samuel D. Goldberg of a Brooklyn, N. Y., chemical company and Willet F. Whitmore of the Polytechnic Institute of Brooklyn. The studies were made on experimental animals.

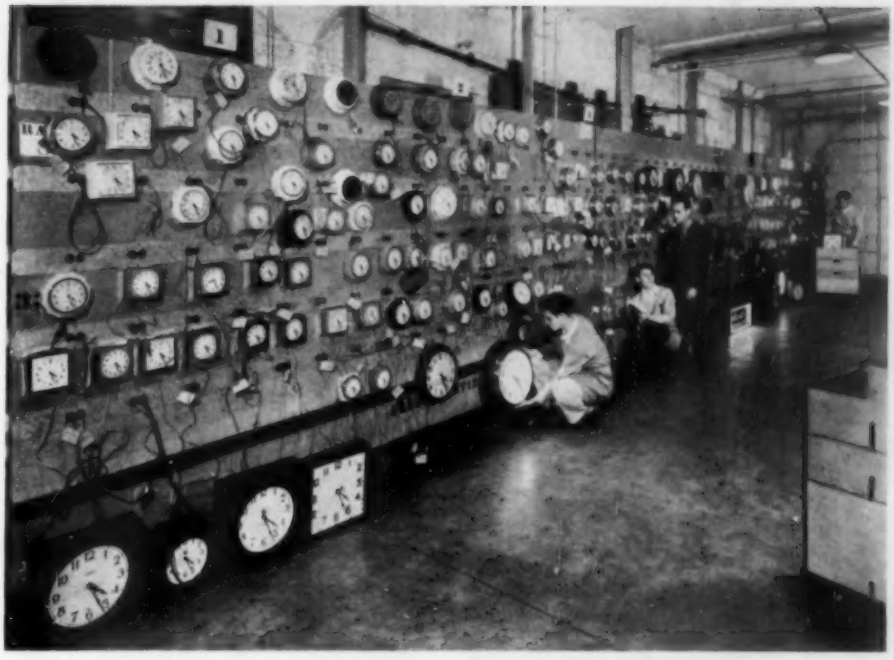
The new organic anesthetic, known as moncaine, is slightly more toxic than is procaine but can be used in smaller amounts.

Tonsil, tooth and eye operations have been performed with the new anesthetic, which is claimed to be an improvement over the combination of procaine and ephinephrin now widely used.

The long search of science for an improved local anesthetic extends from the discovery of ether as a general anesthetic in 1848, to the development of cocaine as a local anesthetic in 1885 and the creation of novocaine, or procaine, in 1905, said the scientists.

But along with procaine it was found necessary to use some agent which would localize its effect so that the combination of procaine-epinephrin has been adopted. Some patients are unable to take this local anesthetic, however, so the research work goes on.

The moncaine anesthetic and another known as amylcaine, which was also reported by the Brooklyn scientists, are another step on the way. Further testing and a wider experimentation in human beings is being carried on, they pointed out.



*ADJUSTING FOR BOULDER DAM POWER*

***One hundred and seventy-two clocks (count 'em) were only a small part of the enormous total of 125,000 which needed readjustment when the supply of electricity from Boulder Dam came in recently. These clocks formerly operated on 50 cycle current and the new power source is 60 cycle current. Thus each one had to be slowed down to overcome the gain of 12 minutes each hour which the shift would have caused.***

### Right Way to Cook Fish

The old-fashioned rules in the family cook book for cooking fish may have to be revised because of the report to the chemists' meeting by Maurice E. Stansby of the U. S. Bureau of Fisheries, College Park, Md.

It seems there is a "best" way of cooking fish for every season of the year, based on chemical studies of the oil content of the fish at the particular time it is caught. The fish's oil content, said Mr. Stansby, is a measure of its value in calories of food energy.

Fish having high oil content, he declared, should never be fried since the frying process decomposes the highly unstable fish oils and gives a rancid flavor. Some fish can be fried at some seasons of the year when their bodies have a low oil content, but should be broiled or baked at other seasons.

Common mackerel is one fish whose body oil content varies widely throughout the year, said Mr. Stansby. Its oil content is commonly quoted as being 7.1 per cent. but it varies from a minimum of from two to three per cent. in the spring to as much as 30 per cent. in the late summer and early fall. Thus the food energy content of a pound of mackerel varies from 450 calories in the spring to as much as 1,000 calories in the fall.

Maybe the consumer will be having dated fish yet.

*Science News Letter, April 24, 1937*

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Packaged poultry, ready for the oven, is now being sold.

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Bouncing cranberries is no playful game, but a test of cranberries in grading them for market: berries in bad condition won't bounce.

VITAL STATISTICS

## Lower Maternal Death Rate In Childbirth in 1937

FEWER deaths of mothers in childbirth is the bright spot already showing in the 1937 health record. A drop of 11 per cent. in the cumulative death rate for diseases of the maternal state is announced by the Metropolitan Life Insurance Company. This means that out of every hundred mothers giving birth to children so far this year, 11 who might have died have been saved.

The figures of the life insurance company apply to industrial policyholders but the maternal death rate has been declining continuously in the general population of the United States as well.

The drop in the country's birth rate has obviously been an important factor in reducing maternal deaths due to conditions associated with childbirth, since fewer women are being exposed to this risk. The drop in maternal mortality, however, has been much greater than that in the birth rate, the life insurance company statisticians point out. This shows that genuine improvement has taken place. Credit for the improvement goes largely to the increasingly better medical supervision and nursing care that American women, as a class, have been receiving before, during and after the birth of their children.

*Science News Letter, April 24, 1937*

PUBLIC HEALTH

## Winners in City-County Health Contests Announced

NAMES of cities and counties in the United States that do most to protect the health of their inhabitants have just been announced. These are the winners this year in the city and rural health conservation contests conducted annually by the Chamber of Commerce of the United States with the American Public Health Association.

Milwaukee, Wis., is winner among competing cities of over 500,000 population. Reward for meritorious achievement was given to Pittsburgh. Other winners are: for cities between 250,000 and 500,000, Dallas, Texas; for cities between 100,000 and 250,000, New Haven, Conn.; for cities between 50,000 and 100,000, Pasadena, Calif.; for cities between 20,000 and 50,000, Greenwich, Conn.; for cities under 20,000, Middletown, N. Y.

In the rural contest the country is divided into six geographic areas. Winners of this contest are: for the northeastern division, Columbia Co., N. Y.; for the eastern division, Davidson Co., Tenn.; for the southeastern division, Pike Co., Miss.; for the north central division, Shawnee Co., Kans.; for the south central division, Dallas Co., Texas; for the western division, Los Angeles Co., Calif.

Not all cities in the country compete. Improvement in health and a saving of thousands of lives, however, is believed to have been accomplished as a result of the stimulation to health protection which participation in the contest provides. Among the larger cities, for example, the 26 cities which have continuously competed had in 1934, last year for which complete returns are available, a death rate which if it had prevailed in the remaining large cities of the country would have represented a saving of 19,600 lives annually.

The city health contest is financed by a group of life insurance companies and the rural contest by the W. K. Kellogg Foundation of Battle Creek, Mich.

*Science News Letter, April 24, 1937*

ETHNOLOGY

## Indians Could Read Beads? No, Says Ethnologist

NO USE handing an Indian an old wampum belt and asking him to read historic events or secrets "written" in bead patterns.

Bead writing of this sort never existed, says J. N. B. Hewitt, Smithsonian Institution ethnologist. Yet many white people, even some Indians, believe certain tribes invented a bead language to record matters of importance.

So persistent is the belief, says Mr. Hewitt, that wampum belts have even been seized and destroyed, in the mistaken idea that Indians would then have no record of some treaty argument, or business deal, or "heathen" ceremony.

In fairly modern times, an Iroquois chief would hold wampum strands while reciting the ritual called the requickening address. But Mr. Hewitt cannot find the slightest evidence that a chief got any help from the beads for the actual information in his address.

Iroquois Indians did devise certain bead arrangements to serve as cues for memorizing points. An Indian speaker who "read the wampum" was merely keeping track of, say, whether he had reached point four or not.

*Science News Letter, April 24, 1937*

# IN SCIE

MEDICINE

## Serum Most Powerful Weapon Against Pneumonia

MOST powerful weapon the modern physician can use to fight pneumonia, which takes an annual toll of more than 100,000 in the United States, is specific immune serum, Dr. Edward L. Bortz, of the Post-Graduate School of Medicine of the University of Pennsylvania, told physicians at the Post Graduate Institute of the Philadelphia County Medical Society and the First District Councilor Meeting.

Describing the dramatic results obtained with serum in treating pneumonia, Dr. Bortz said:

"From a desperate, acute, consuming illness with a dangerous temperature, chest pain, restlessness, paroxyms of cough, and approaching delirum, the prompt administration of the correct serum will sweep away the toxemia, the temperature will fall, the pain in the chest will disappear, the pulse and respiration return to normal, the cough is quieted and the patient finds himself practically a well man, emerging as it were from an evil dream.

Turning to statistics, Dr. Bortz said the high pneumonia death rate can be cut at least 50 per cent. by modern treatment, which means prompt diagnosis and treatment with the appropriate serum. Diagnosis in pneumonia means determining by laboratory tests of the patient's sputum which of the many pneumonia germs are causing the disease in a particular case. This test is called typeing and the germs are known respectively as Type I pneumococcus, Type II pneumococcus, and so on for all the different members of the pneumonia germ family.

Unfortunately, curative serums have not been developed for all the pneumonias, but where they have, their use will save thousands of lives.

Nutrition, elimination, rest and nursing care are other important factors in the treatment of pneumonia. Dr. Bortz said that oxygen is an important aid, but that its use "has unfortunately not affected the mortality rate."

*Science News Letter, April 24, 1937*

# EE FIELDS

DENTISTRY

## More Toothache For Boys Than Girls

HERE is bad news for little boys and better, although not entirely happy news for little girls—science has found the boys are far more likely to have toothache than the girls.

Among 98 boys and girls between 6 and 8 years old, the girls averaged 8.12 cavities per girl and the boys averaged 13.72 cavities per boy, Drs. Paul K. Losch and Fred W. Morse, Jr., of Harvard Dental School reported.

Of the five boys and five girls with the most cavities, the average per child was 38.2 for the boys and only half that, 16.8, for the girls. Of the five boys and girls having fewest cavities, the girls had not a single cavity but the boys averaged 2.6 cavities per boy.

Searching for causes, the Harvard dentists found only three factors ordinarily associated with tooth decay which had any positive correlation with the cavities found in the 98 children. These factors were the number of prolonged illnesses, such as would interfere with nutrition; the presence of aciduric bacilli; and early rickets due to insufficient vitamin D.

*Science News Letter, April 24, 1937*

MEDICINE

## Kidney Infections Yield To New Germicide

THE NEW chemical germ fighter, sulfanilamide, which gives promise of conquering deadly streptococcus infections such as childbed fever, is apparently also winning the fight against infections of the kidneys and bladder.

Successful use of this chemical and its relative, Prontosil, in the treatment of these common and often refractory infections was reported by Dr. Russell D. Herrold of the University of Illinois College of Medicine at the meeting of the Society for Experimental Biology and Medicine.

"This drug would seem to be the first definite advance in the use of chemicals to combat infections since the discovery of the chemical treatment of syphilis. It opens a new field in the fight against infectious diseases," he said.

"It is startlingly successful, often in as short a time as three days," Dr. Herrold stated. "Its action apparently is somewhat different from that of another useful urinary tract antiseptic, mandelic acid, which has become quite generally used in the past six months. It is destined to replace the acid almost completely.

"The new compound is much more palatable to the patient," he said. "In one-tenth of cases, mandelic acid cannot be used. The new chemical has revealed no such limitations yet."

The chemical is taken by mouth in tablet form and in serious cases is made into a solution for hypodermic injection.

*Science News Letter, April 24, 1937*

PALEOBOTANY

## Fossils in the Making Found Under Volcanic Ash

FOSSILS were not all made and stored in the rocks millions of years ago. The first steps in the making of plant fossils have been seen and reported to the Carnegie Institution of Washington by one of its research associates, Dr. Ralph W. Chaney, chairman of the department of paleontology at the University of California.

When the great triple-peaked volcano Katmai in Alaska blew up in 1912, hurling some five cubic miles of ash into the air, part of the finely powdered material settled like snow on the branches of evergreen trees, pulled off billions of their needles, and bore them down to the ground.

Now, a quarter-century after the great eruption, Dr. Chaney has revisited the region and dug down to the bottom of the foot-deep ash. There he found the tree leaves pressed down in a matted layer, mostly in the lower few inches. They looked for all the world like the matted fossilized leaves he has often investigated in the ancient geological deposits in Oregon known as the John Day formation, which were volcano-formed many millions of years ago.

Of course the single Katmai eruption layer had only a small fraction of the thickness of the John Day formation. Many more eruptions, covering many centuries, would be needed before the Alaska situation would resemble the Oregon beds. But the basic principle is the same; and one man has seen, well within his working lifetime, the beginning of a true process of fossilization.

*Science News Letter, April 24, 1937*

ASTRONOMY

## Probe to Universe's Limits For New Light on History

A WIDE-spread search that extends to the limits of the visible universe is being pursued in the hope that new light will be shed upon history, scientifically speaking.

Astronomy is not usually considered a branch of history but telescopes can look out in space's depths and see what happened there a hundred million years ago—that is, light from a stellar outburst takes that time to reach earth.

Dr. Fritz Zwicky, young and brilliant California Institute of Technology physicist, is investigating history in this sense with the help of Mt. Wilson Observatory's Drs. W. Baade, Edwin Hubble and M. L. Humason.

Scientifically speaking, he says, "history means the change in time of dimensionless ratios of significant physical quantities." As for instance, the famous red shift in the rainbows or spectra of distant star aggregations as compared with nebulae relatively neighbors to the earth. Interpreted under the theory of relativity, this is a historical effect.

The assumption that history must be operative suggests clearly to Dr. Zwicky the necessity of an investigation of all those dimensionless ratios between significant physical quantities. Only after this investigation has been completed does he believe a final understanding of the red shift and other cosmic phenomena will be possible.

Other effects are being investigated by Dr. Zwicky. There does not seem to be any significant difference in the speed of light from distant parts of the universe compared with light from nearby stars. But there are suggestions that great exploding stars, distant supernovae, spraying light and particles out into space, are seen or "received" imperfectly here on earth because some kinds of their radiations travel more slowly than others. Suggestive discrepancies have turned up in astronomical studies but not so positively that conclusions can be drawn.

This is the stuff that philosophy is made of. As yet the researches stay within the bounds of relativity theory's principles, but this investigation on fundamental reference systems for physical measurements on a cosmological scale may well go beyond the classical theory of general relativity. It promises to out-Einstein relativity.

*Science News Letter, April 24, 1937*

ASTRONOMY

# Planets Gain Attention

## Mars Now Visible During Entire Night; Rare Partial Transit of Mercury Will Also Occur During May

By JAMES STOKLEY

COMING into view in the evening sky after an absence of many months the planet Mars is now visible during the entire night. At the beginning of May it is seen low in the southeast almost as soon as it gets dark. It is above the star Antares, in Scorpius, the scorpion. Both planet and star are shown on the accompanying maps. These depict the appearance of the heavens at 10:00 p. m. (standard time) on May 1, 9:00 p. m. on the 15th and 8:00 p. m. on the 31st.

On May 24, Mars is directly opposite the sun. Then it rises at sunset and sets at sunrise. At about this time it is also at the closest approach it makes to the earth on this trip around the sun. May 27 is the date when the distance is least. Then it is 47,242,300 miles away. Sometimes it can approach even closer, to as little as 34,600,000 miles, but it can also get as far away as 245,000,000 miles, so just now it is really quite neighborly. Many observatories are taking advantage of this close approach to study it.

No other planets are visible in the early evening sky during May, but Jupiter rises about 12:30 a. m. (standard time), at the beginning of the month and about 10:30 at the end. It is then a brilliant object in the southeast. Saturn and Venus both appear in the east about two hours before sunrise. The latter is by far the brighter, and on May 24 will be at its greatest brilliance, about ten times that of Sirius, the brightest star.

### Heavenly Mirrors

These planets are all bodies like the earth, shining by reflected sunlight, but the other objects seen in the night-time sky are stars, far distant suns. Most brilliant of these now to be seen is Vega, in Lyra, the lyre, low in the northeast. Still lower is Cygnus, the swan, which contains the bright star Deneb.

High in the north is the great dipper, part of Ursa Major, the great bear. The dipper is upside down, the bowl to the left. The pointers, the two stars in the bowl farthest from the handle, indicate the direction of Polaris, the pole star.

By following the curve of the dipper's handle to the south, it is easy to find another bright star, Arcturus, in Bootes, the bear driver. Along this same curve, still farther south, is Spica, marking Virgo, the virgin. To the right of Spica is Corvus, the crow, consisting of four stars in a conspicuous quadrilateral.

By following the pointers to the south one soon comes to Leo, the lion, high in the west. This contains a smaller group called the sickle, which has the star Regulus at the end of the handle, to the south. Low in the west and northwest are a few stars that remain of the glorious groups that ornamented the evening skies of winter.

### Procyon

Almost directly west is Procyon, in Canis Minor, the lesser dog. Farther north is the group of Gemini, the twins, with first magnitude Pollux, and the fainter Castor. Still farther north is Augriga, the charioteer, with Capella.

It is unfortunate that the chief event on the May celestial program, a phenomenon which occurs approximately once in a thousand years, is not visible from North America. This is a partial transit of Mercury. The planets revolve around the sun in orbits approximately circular, but not in quite the same plane. Nearest the sun is Mercury, which moves in a path inclined 7 degrees to that of the earth. Then comes Venus, with a path inclined 3.4 degrees to ours. Next beyond is the earth.

Every 584 days Venus comes almost between the earth and the sun, but generally it is either above or below the line joining the two latter bodies. At rare intervals, however, it happens to be in this position at the time that it is also in the plane of the earth's orbit. Then it comes squarely between the earth and sun, and can be seen as a black spot on the solar surface. This is called a transit of Venus. The last transit occurred in 1882, the next will not come until 2004.

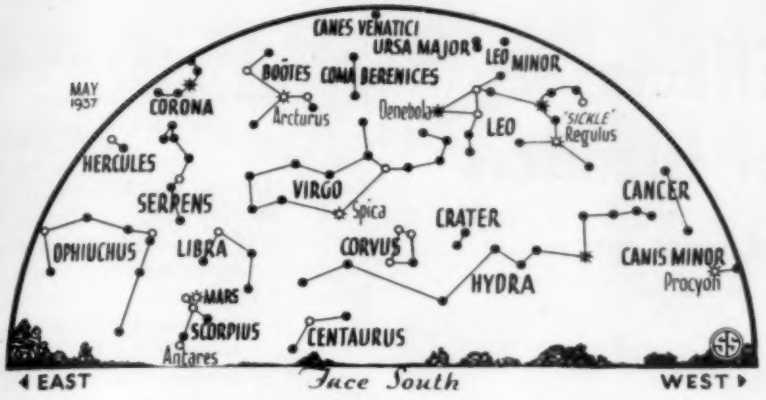
### Every Thousand Years

Transits of Mercury are more common, and happen every seven years on the average. There was one on November 8, 1927; there will be another in 1940 on November 12. Then the planet will be completely in front of the sun. A person looking through a telescope equipped with the proper eyepiece, for protection from the solar brilliance, will see the huge disc of the sun, with a tiny speck upon it. On such an occasion, the sun's apparent diameter is about 160 times that of Mercury.

Mercury is very much smaller than

*RUDDY MARS*

***You can now follow it all through the night.***




*OLD FRIENDS*

***Here are the familiar constellations of the north***

the sun, mere speck, in fact. If it comes in front of the sun at all, it is generally completely in front of it. If it does not cross the disc, it misses it completely. But, at rare intervals, about once in a thousand years, it just skims along the sun's edge, partly on it, partly off. That is what will happen May 11. It will take about 40 minutes from the time the edge of the planet first touches the edge of the sun until it leaves.

From a point in the Indian Ocean, about 2000 miles south of Australia, Mercury would be seen to enter for more than half its diameter on the solar disc. It is not very likely that anyone will see it from this inaccessible location. But from most of southern Asia, the Philippine Islands, Western Australia, the Indian Ocean, and central and southern Africa, the planet will be seen to enter the sun's disc to a lesser extent. Many observatories are located in these regions, and to astronomers watching, the sun's disc will be seen to have a small nick in the edge.

### Is There Atmosphere?

The chief value to astronomy of this partial transit will be in the possibility that it affords of checking the existence of an atmosphere on Mercury. Theoretically, it has none. For every planet there is a velocity of escape, a speed at which a thing, whether as small as an atom or as large as a house, can be thrown so that it overcomes the planet's gravitational attraction and leaves it for good. For the earth this is about 7 miles per second. Because Mercury is so much smaller, the critical speed there is only 2.2 miles per second.

The molecules of a gas, like the atmosphere of the earth, are in constant motion, but they seldom achieve the speed of 7 miles per second. Therefore, the molecules do not leave the earth, as they would if they were moving more rapidly. On Mercury, not only is the velocity of escape lower, but the planet is nearer the sun, the temperature is higher, which would give the atmosphere molecules higher velocities than they would have on earth. Consequently, most of them move faster than 2.2 miles per second. Therefore, if Mercury were suddenly to be endowed with an atmosphere like that of the earth, it could not hold it very long for the molecules would soon shoot off into space.

### Opportunity for Tests

There seems to be no flaw in this reasoning, but certain observers of Mercury have noticed peculiar effects which they interpret as showing the presence of an atmosphere after all. If there were an atmosphere, it would bend light rays around it, like a prism, and, with the sun behind it, the dark disc of the planet should be surrounded by a brilliant halo. Venus has some sort of an atmosphere, and, at the time that it enters or leaves the sun's disc, at a transit, shows such a halo.

At ordinary transits of Mercury, the planet is so small, and moving so quickly, that there is little time to make these observations as it enters or emerges from the disc of the sun. When it is on the disc, the sun's own brilliance would make it impossible to see a halo. But this time there will be many minutes while the planet is partially on the disc. During this time, there should be plenty of opportunity to see whether there is any effect of an atmosphere. If there is, observers should notice a half ring of light, extending out from the sun's edge. If this is not seen, it will be good evidence that the theoretical considerations are correct.

On May 10, at 1:00 p. m., E. S. T., the moon will be at perigee, or nearest the earth, with a distance of 222,040 miles. It will be at apogee, on the 24th at 8:00 a. m., 252,430 miles away.

On May 24, during the daytime for us, the moon will pass very close to Mars. On the evening of that date, as well as the previous night, the two objects will be very close together. In some parts of the southern hemisphere, Mars will actually pass behind the disc of the moon, it will be occulted.

**Phases of the Moon**

| | | E. S. T. |
|---|---|---|
| Last Quarter | May 3 | 1:36 p. m. |
| New | 10 | 8:18 a. m. |
| First Quarter | 17 | 1:49 a. m. |
| Full | 25 | 2:38 a. m. |

*Science News Letter, April 24, 1937*

PSYCHOLOGY

## Literacy

● "By the time he has reached school age it has been estimated that the normal child has an understanding vocabulary of several thousand words. This forms the foundation on which he must begin, at the age of six or thereabouts, to erect an entirely new form of language—reading and writing—if he is to take his place in the literate world. In the occasional very precocious child, reading and writing can be taught much before the age of six, but taking our school population at large, attempts at teaching graphic language before this age are unprofitable and it seems probable that it is this fact which has determined the age of six for an introduction for formal academic training."—Samuel Torrey Orton in READING WRITING AND SPEECH PROBLEMS IN CHILDREN (*Norton & Co.*).

*Science News Letter, April 24, 1937*

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ANTHROPOLOGY

# No Biological ill Effects From Inbreeding of Islanders

## Anthropologists Also Hear of Blood Tests on Mummies Dead These 5,000 Years or More

NEW evidence that close inbreeding of human beings has no ill effects if the original stocks were biologically sound was presented by Dr. H. L. Shapiro of the American Museum of Natural History to the meeting of the American Association of Physical Anthropologists at Cambridge, Mass.

All of the present population of Pitcairn Island, 202 persons, are descended from six of the mutineers of the famous ship "Bounty," who settled on the island in 1790, with a dozen Tahitian women.

"Inbreeding has been common to such an extent that practically everyone is related to all other members of the community," Dr. Shapiro stated. "Despite this inbreeding the islanders are healthy, vigorous and are free from stigmata of degeneracy. This finding confirms the inbreeding experiments of the laboratory which demonstrate that inbreeding as a process does not lead to disaster. The evil consequences which occur in some inbred stocks may more correctly be attributed to latent defects which are intensified and brought to the surface by inbreeding."

Products of the first matings of the white sailors with the native women seem to have had unusual virility, due perhaps to the reaction to cross-breeding which biologists call "hybrid vigor." The earlier generations were larger as individuals than either of the parent groups, and they were amazingly prolific. The women born in the period from 1815 to 1839 bore an average of 11.4 children each.

### Test Mummies

Blood group tests, such as sometimes figure spectacularly in cases of disputed parentage dragged into court, can be performed on the long-time dead as well as on the living. A report of such tests carried out on 300 mummies, including Egyptian, Peruvian, Basketmaker, and ancient Aleutian Indians of Alaska, was presented to the meeting by Drs. William G. Boyd and Lyle G. Boyd of Boston University.

Blood groups A and B were found to be present in some of the oldest Egyptian mummies, including a number belonging to times over 5,000 years ago, before any Pharaoh yet ruled in Egypt. The same groups were found in a few ancient Peruvian mummies. Basketmaker mummies responded to the test for blood group A, but not B. All other Indian mummies, including the recently discovered Aleuts, having neither the A nor the B factors, are assigned to blood group O.

One result of this research, in the opinion of the Drs. Boyd, is apparently to overthrow the belief held by some investigators, that the differing blood groups among humans evolved within comparatively recent times.

### Barrels of Bones

What would you do if somebody wished 80 barrels of human bones on you?

That is what the U. S. National Museum is up against, Dr. T. D. Stewart told his fellow-anthropologists.

The bones were collected in the course of excavations for public works, carried out by the C. W. A. Whenever the men found an ancient Indian burial, they saved the bones and sent them on to the museum at Washington for possible scientific value.

A considerable part of this great mass of bones has potential usefulness to science, Dr. Stewart told his audience, but much of the material is too badly broken and crushed to be worth keeping. The job of sorting is now going on.

### Noses Grow Narrower

Noses on children's faces apparently lose width during several years of growth, Dr. M. S. Goldstein of New York University reported. He measured the width of the bridge of the nose on fifty boys, repeating the measurement biennially between the ages of 3 and 21.

"At all levels the widths consistently diminish between 3 and 17 or 19 years," said Dr. Goldstein. "It is believed that this indicates not a real decrease in width of the bridge, but rather a consequence of its increasing height. At about 19 years the widths begin to increase, probably a sign that the height of the nose has reached its maximum growth. An old age group manifests a broader nasal bridge at all levels."

### Balanced Brains

Brains of the lower members of the primate, or ape-monkey family, are remarkably symmetrical. Each half exactly mirrors the other.

This condition, in marked contrast to the usually somewhat unevenly balanced brains of the higher primates, including man, was described by Dr. C. J. Connolly of the Catholic University of America.

Dr. Connolly worked on the large collection of primate brains in the U. S. National Museum. In all, he studied 210 brains, representing 40 different species.

The symmetry which he discovered was expressed not only in the evenly matched sizes and shapes of the opposite halves of the brains, but also in their principal furrows or sulci.

He also found differences in form between specimens of opposite sex, in many of the groups, but there was no sex difference discernible in the patterns of the furrows.

*Science News Letter, April 24, 1937*

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## ●RADIO

*April 27, 4:15 p. m., E.S.T.*

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*May 4, 4:15 p. m., E.S.T.*

**NEW INDUSTRIES FOR OLD—Dr. E. R. Weidlein, Director of the Mellon Institute.**

**In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.**

HYGIENE

## Dose Spring Fever With Sunshine and Fresh Air

MODERN scientific medical books do not mention spring fever. Sulfur and molasses and "yarb tea" are hardly to be found in kitchenettes or the modern family medicine chest. Yet the disease or condition for which these were the old-time remedies still exists in our streamlined civilization.

Spring fever is "the popular name for a common experience," says the U. S. Public Health Service. It is made up of a feeling of languor, a desire for more fruits and vegetables, and a longing to play hooky, from business or school, and spend the day out of doors.

No one is immune to this disease and there is no vaccine for it. It afflicts the old and the young, the office worker, the housewife and the school boy.

According to one physician, the condition is due to a depletion during the winter months of the body's store of calcium. Certainly the cold of winter stimulates the average person to work harder and indulge in more strenuous and interesting activity. All this uses up more mental, nervous and physical energy. When warm weather comes there is a let down in activity and energy expenditure which is most noticeable in the first days of spring.

The best remedy for spring fever does not come from medicine bottles or Grandmother's yarb kettle. A modern scientific prescription for a spring fever remedy might be written as follows: Sunshine and fresh air flavored with fishing poles, golf sticks or flivvers; liberal doses, to be taken as often as desired.

If you feel you must have any additional spring tonic, the U. S. Public Health Service advises you to make this the season for an annual physical examination by a physician.

*Science News Letter, April 24, 1937*

PSYCHOLOGY

# War, Politics, Depression Fail to Influence Insanity

## It's Not the Standards of Society That Determine Whether a Man Is Mad; It's In the Patient Himself

NEITHER a Soviet nor a Nazi form of government will reduce the proportion of insanity among the people under its rule, Drs. James Page and Carney Landis, of the New York State Psychiatric Institute, told the Eastern Branch of the American Psychological Association meeting at Poughkeepsie, N. Y.

Political regimes and even major catastrophes like the World War, the wholesale loss of life in the influenza epidemic, and the great economic depression have no effect upon the incidence of mental disease, these investigators reported.

The explanation for a recent lowering in the number of persons in Germany diagnosed as having the mental disease dementia praecox lies not in the Nazi stress upon national feeling and military lack of self-centeredness, but in the fact that all patients so diagnosed must be sterilized, Drs. Page and Landis indicated. Physicians in Germany today rarely diagnose a patient as having this mental disease.

Discounted by these investigators was the theory that the mental soundness of a person depends upon the standards of the civilization in which he happens to live. Transporting the paranoid person with delusions of persecution to a culture where all persons are mutually suspicious, distrustful and insulting would not result in his being considered normal. Nor would the suicidal patient be thought normal in Japan.

It is not such surface symptoms that determine whether a person is mentally abnormal in our own civilization; it is the fact that these variations from custom are illogical, incomprehensible, and unmodifiable. He can't help himself.

"Our hospitals for the criminally insane are filled with murderers, but a policeman or soldier who kills is often given a medal," said Dr. Page. "Some mental patients are hospitalized because they continually disrobe in public, and so do well paid burlesque stars."

Cure of a nineteen-year-old boy who suffered from fear of the dark so intense that it amounted to a phobia and made him literally unable to remain alone in a dark room was described to the meeting by Dr. G. Milton Smith of the College of the City of New York.

The young man was also distressed by the fact that he could not remember his father, who died when the son was five, and by his mother's persistent refusal to talk of his father.

Under hypnosis, he remembered the terrifying experience that had produced the phobia. He described in astonishing detail a room in an apartment where he had lived at the age of five and a man, his father, who sat there reading. Without warning, the father jumped up and began to yell and wave his arms about, his face horribly contorted. The child fled in terror down a long dark hallway, the father staggering after him.

The father, it was found, had suffered from paresis and died in an asylum. The boy was cured through the aid of the hypnosis.

### Stuttering Minds

The repetitious speech of a stutterer is an indication of a similar repetition of ideas in his mind—a tendency for ideas to remount into consciousness after they have once occurred, experiments reported by Drs. J. Eisenson and C. N. Winslow, of Brooklyn, indicated.

### Gullibility

Gullibility, or the willingness to swallow whole anything one hears, is a mat-

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ter not alone of intelligence—or rather lack of it—but also of training and special ability. Thus an intelligent person may be versed in psychology and hence not gullible, but uninformed and gullible in mathematics or physics. So Dr. S. B. Sells, of Columbia University, told his colleagues.

### Startled Twins

Left-handed twins jump more when they are startled by a revolver shot than do their identical brothers or sisters, Drs. William A. Hunt and Frances M. Clarke, of Connecticut College for Women, told the meeting. The explanation for this has not yet been determined, but it was suggested that it might have to do with the side of the brain that is dominant.

The typical movements of startle—hunched shoulders, bent elbows, drawn up arms, bent knees, contracted abdomen, and so on—are shown by children as well as grownups and are much stronger and regular in the children. The younger ones also run away; the older ones show, instead, curiosity and attention to the source of the sound.

### Cats See at Night

Cats prowling at night can see in only one-fourth the amount of light that is necessary for the human eye, tests of feline vision made by Dr. Charles S. Bridgman, of the University of Rochester, revealed.

Most important in helping the sight of the cat that prowls at night is the large area of her dilated eye pupil, Dr. Bridgman said. When it is at its largest it is double the size of the human pupil's maximum. The eye is like a camera; it lets in more light and takes the picture quicker when the aperture is large.

Tabby cannot distinguish changes in illumination so well as you can, however, according to tests reported by Dr. L. C. Mead, who worked with Dr. Bridgman at the University of Rochester.

### Thrift Taught Chimpanzees

Lessons in thrift are the latest accomplishment of the famous Yale chimpanzees who have already learned to work for "money" discs and to spend them in a "chimpomat," a machine which automatically yields raisins and other chimp tidbits as familiar slot machines give up cigarettes or gum.

Now the chimpanzees have learned to save their pay until a hoard is accumulated and will then carry it from the work room to another room serving as market place where the chimpomat is located and where they can spend their savings. The thrift lessons were described by Dr. John T. Cowles, of Yale.

The desire of the chimpanzee baby for "comfort" in the arms of mother or caretaker or at least nearness to them is so strong that it can serve better than hunger as a reward and motive for the young animal to learn what experimenters want to teach him, Dr. T. L. McCulloch, of the Yale Laboratories of Primate Biology, told the meeting.

### First Heart Beats

"Heart interest" was featured in a motion picture film shown before the meeting, in which the important first heart throbs of a young life were shown upon the screen. The young life pictured was that of a baby chick from the time when heart beats alone were visible up to the time just before hatching.

The film was a presentation of Drs. Z. Y. Kuo and Leonard Carmichael of the University of Rochester.

*Science News Letter, April 24, 1937*


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BOTANY

## NATURE RAMBLINGS by Frank Thone

### "Worts, Worts, Worts!"

MUCH folk-wit and folk-fancy are monumented in old common names for plants.

There is an almost endless list of "worts," for example. "Wort" is an ancient English word, long since obsolete, meaning simply a plant or herb. The old wort-names seem to indicate real or fancied resemblances to other objects, medicinal values, place of growth, etc. We have liverwort, lungwort, spleenwort, toothwort, milkwort, butterwort, soapwort, feverwort, louse-wort, spiderwort, sandwort, pearlwort, pennywort, starwort, ragwort, mugwort, St. John's wort.

There are also a good many "banes"—presumably once considered good for getting rid of pests, or on the contrary harmful to oneself or one's livestock. Thus we have bugbane and fleabane, and also dogbane, catsbane, henbane, cowbane, and baneberry.

Familiar animals, both domestic and wild, have their share of plants assigned: cowslip ("cow's lip," originally), cowbane, cow-herb, horseweed, horsemint, horseradish (but that's a corruption of "harsh radish"), horsetail, horse-chestnut, goatsfoot, goatsbeard, buckwheat, sheep-sorrel, lamb's-quarters, duckweed, foxglove, bearberry, wolfsbane.

Some folk-names of plants are of distinctly American origin, since the plants they belong to, or the animal sponsors, are not known in Europe. Thus for example Jack-in-the-pulpit, butter-'n-eggs, buffalo-berry, rattlesnake root, compass plant, shooting star. We see, then, that folk-names are not things of a quaint and finished past, but are continually being thrown off by the reaction of folk-mind to the contact of new things.

*Science News Letter, April 24, 1937*

# *First Glances at New Books

Additional Reviews on Page 272

**Medicine—Quackery**

NOSTRUMS AND QUACKERY AND PSEUDO-MEDICINE, Vol. III — Arthur J. Cramp—*American Medical Assn.*, 232 p., $1.50. Made up almost entirely of new material, this volume is a worthy addition to its predecessors. If the reader is tempted to enroll in a diet course or buy an advertised remedy for stomach trouble or any other ill that he has or fancies he has, he might save himself much grief and money by first reading this book. Terse, simple and factual accounts of hundreds of nostrums and of the ways of pseudo-medical practitioners are presented by the former director of the bureau of investigation of the American Medical Association.

*Science News Letter, April 24, 1937*

**Nutrition**

CHEMISTRY OF FOOD AND NUTRITION (5th ed.)—Henry C. Sherman—*Macmillan*, 640 p., $3. Written for college students from the angles of both chemistry and nutrition, this standard text contains much information that would interest the intelligent layman who is not discouraged by a few technical terms, charts and graphs.

*Science News Letter, April 24, 1937*

**Medicine**

A LAYMAN'S HANDBOOK OF MEDICINE, WITH SPECIAL REFERENCE TO SOCIAL WORKERS — R. C. Cabot — *Houghton, Mifflin*, 541 p., $2.50. Second edition of a simple, highly readable and practical book on health and disease. The readability is gratifyingly increased by the typography.

*Science News Letter, April 24, 1937*

**Physiology**

THE HUMAN MACHINE—John Yerbury Dent—*Knopf*, 294, v p., $2.50. Interesting and different from most popular books on the human body is this volume by an English physician. The emphasis is on behavior with the physiological basis brought in casually but effectively.

*Science News Letter, April 24, 1937*

**Physiology**

LA CONNAISSANCE SENSORIELLE ET LES PROBLÈMES DE LA VISION—Henri Piéron —*Herman & Cie, Paris*, 91 p., 15 fr.

*Science News Letter, April 24, 1937*

**Travel**

THE CLEAR MIRROR, A PATTERN OF LIFE IN GOA AND IN INDIAN TIBET—G. Evelyn Hutchinson — *Cambridge (Macmillan)*, 171 p., plates, $2.50. From familiar objects reflected in mirrors all around, "whole new worlds can be constructed." On this poetic theme, the author builds with colorful descriptive flashes a picture of strangely foreign worlds in India, with special emphasis on art and religious influences. Mr. Hutchinson was a biologist with the Yale North India Expedition when he visited the places described.

*Science News Letter, April 24, 1937*

**Anthropology**

THE STUDY OF MAN—Ralph Linton —*Appleton-Century*, 503 p., $4. Man's explanation of himself is his most ambitious task. This being true, and anthropology being so young a science, Dr. Linton thinks we can be proud of what is already learned concerning man's evolution, mentality, cultural patterns, and that elusive factor, individual personality. The volume is intended as an introduction to anthropology, for either the student or general reader.

*Science News Letter, April 24, 1937*

**Technology**

THE STORY OF NEWS PRINT PAPER—*News Print Service Bureau*, 76 p., $1; 25 copies, 75c ea., 50 copies, 50c ea. Factual, non-technical information about an important industry. It is suitable for use in schools.

*Science News Letter, April 24, 1937*

**Mathematics**

HANDMAIDEN OF THE SCIENCES—Eric Temple Bell—*Williams & Wilkins*, 216 p., $2. Presupposing no technical knowledge of mathematics, Prof. Bell traces the applications of mathematics in the other sciences, producing a worthwhile and enjoyable volume.

*Science News Letter, April 24, 1937*

**Biology**

MANUAL OF BIOLOGICAL ASSAYING—James C. Munch—*Lippincott*, 179 p., illus., $2. This manual, which has stood the test of classroom trial, should prove useful to student, teacher and the practicing bioassayist himself, since it gives official bioassay methods and requirements of the United States, Canada and Great Britain.

*Science News Letter, April 24, 1937*

**Chemistry**

A. S. T. M. METHODS OF CHEMICAL ANALYSIS OF METALS: ANALYTICAL PROCEDURES FOR FERROUS AND NON-FERROUS METALS, SPECTROCHEMICAL ANALYSIS METHOD—*Amer. Soc. Testing Materials*, 254 p., $2., paper; $2.50, cloth.

*Science News Letter, April 24, 1937*

**Zoology—Travel**

IN QUEST OF GORILLAS—William K. Gregory and Henry C. Raven—*Darwin*, 241 p., illus., $3.50. Much more is known nowadays, both about Africa and about gorillas, than was known when Du Chaillu tramped the bush and told unbelievable tales afterwards. Yet this newest gorilla book somehow brings up again all the old mystery and thrill that our grandsires felt on reading about what was still a "Dark Continent." And the zoological facts are of course both fuller and more accurate, as befits today's improved facilities and better background of knowledge.

*Science News Letter, April 24, 1937*

**Natural History**

HAPPY NATURE ADVENTURES — Mary C. Butler — *Dorrance*, 113 p., $1.25. Price correction; see SNL, March 6, 1937.

*Science News Letter, April 24, 1937*

**Chemistry**

COLLOID CHEMISTRY, PRINCIPLES AND APPLICATIONS (4th ed)—Jerome Alexander—*Van Nostrand*, 505 p., $4.50. Revised again is this much-used reference book, which possesses the facts of a textbook but escapes the dryness of presentation that often characterizes a textbook. The author is a consulting chemist.

*Science News Letter, April 24, 1937*

THE
**Little Things in Life**
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**The absorbing, full account, for the layman of the vitamins, mineral elements, ferments, hormones, ductless glands and their secretions, etc. — "little things" that loom so large in our ways to health. Dr. Sure tells the fascinating story of the experiments that have led to our present knowledge and shows what we can do to benefit by the great discoveries of science. $2.50**

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# •First Glances at New Books

Additional Reviews on Page 271

**Ichthyology**

MARINE GAME FISHES OF THE PACIFIC COAST FROM ALASKA TO THE EQUATOR—205 p., 70 pl., $5. The compleat angler and the inquiring ichthyologist meet on common ground in this unique and well-conceived book. The angler can learn much about the fish he catches (and the bigger ones that get away) and the man of science will get information on where and when to cast a fly or sink a net. Dichotomous "keys" to genera, made intelligible to the layman, are not the least effective of the liaison agents used. Taken altogether, a really magnificent book.

*Science News Letter, April 24, 1937*

**Dietetics**

DIETETICS SIMPLIFIED, THE USE OF FOODS IN HEALTH AND DISEASE—L. Jean Bogert and Mame T. Porter—*Macmillan,* 637 p., illus., $3. Written primarily for students of home economics and dietetics, this book could be used also by the intelligent housewife. There is emphasis throughout on adaptation of standard diets to differences in tastes, individual requirements, and economic factors such as market prices and the pocketbook.

*Science News Letter, April 24, 1937*

**Palaeontology**

PALEOCENE FAUNAS OF THE SAN JUAN BASIN, NEW MEXICO — William Diller Matthew—*Univ. of Pa. Press for the Amer. Philosophical Soc.,* 510 p., 65 pl., 1 map, $5. An exhaustive and exceedingly well illustrated monograph on the early Quaternary fauna, principally mammalian, of an interesting region.

*Science News Letter, April 24, 1937*

**Sports**

THE GAME-WAY TO SPORTS—H. Atwood Reynolds—*A. S. Barnes,* 210 p., diagrs., $2. The skill elements of a number of sports presented in the form of games that can be played in limited spaces for the training of novices.

*Science News Letter, April 24, 1937*

**Biochemistry**

CANCER AND DIET WITH FACTS AND OBSERVATIONS ON RELATED SUBJECTS — Frederick L. Hoffman — *Williams & Wilkins,* 767 p., charts, tables, $5. The author of this book, an eminent statistician, has amassed a large volume of data and opinions which lead him to the conclusion that "overabundant food consumption unquestionably is the underlying cause of the root condition of cancer in modern life." It must be pointed out that this is contrary to the present opinion of most cancer authorities, who hold that the case for a dietary cause of cancer has not yet been proved.

*Science News Letter, April 24, 1937*

**Travel**

GUATEMALA — Erna Fergusson — *Knopf,* 337 p., illus., $3. A travel book that sees beyond the superficial "sights" of a picturesque country into the meaning of the life that goes on there. Miss Fergusson writes with literary charm and an understanding of Indian backgrounds. Guatemala, she finds, is eager for progress, but hobbled pitifully by illiteracy and fear.

*Science News Letter, April 24, 1937*

**Industrial Photography, Juvenile**

RUBBER BOOK, A PHOTOGRAPHIC PICTURE-BOOK WITH A STORY—William Clayton Pryor and Helen Sloman Pryor—*Harcourt,* 101 p., $1. Another in the series of industrial process books by this photographer-author team. In this volume, the children, Ann and Bill, go from rubber trees in distant lands, through factories and then to see a wide variety of everyday rubber uses.

*Science News Letter, April 24, 1937*

**Home Economics**

FIRST FOODS OF AMERICA—Blanche & Edna V. McNeil—*Suttonhouse,* 150 p., $2.50. An attractive and novel cookbook giving a large number of Mexican recipes, including "little whimsical dishes," which have a class of their own in Mexican cookery. The atmosphere of the native American kitchen is pleasantly suggested by pages of Mexican songs about food, silhouette drawings, and introductory remarks about foods of the Aztecs.

*Science News Letter, April 24, 1937*

**Botany**

AN ARTIST'S HERBAL—Louise Mansfield—*Macmillan,* 76 p., 38 plates, $2.50. This is not strictly a botany book; it is what its title claims, an herb book. It takes a couple of score of the best known medicinal and pot herbs, furnishes each with a brief description in which use is emphasized, and gives with each description a full-page monochrome plate that combines scientific accuracy with keen artistic feeling.

*Science News Letter, April 24, 1937*

**Anthropology**

THE ESKIMOS — Kaj Birket-Smith — *Dutton,* 250 p., plates, $5. Eskimos as human beings, not as strange scientific specimens, are described in this well-written book by one of Denmark's noted Arctic explorers. Dr. Birket-Smith has lived as an Eskimo himself, taking part in their weird ceremonies, sleeping in snow huts, even starving with them. The Eskimos he describes include roaming tribes of the Canadian Arctic as well as groups in Greenland and Alaska.

*Science News Letter, April 24, 1937*

**Archaeology**

REDISCOVERING ILLINOIS, ARCHAEOLOGICAL EXPLORATIONS IN AND AROUND FULTON COUNTY—Fay-Cooper Cole and Thorne Deuel—*Univ. Chicago,* 295 p., 36 pl., 37 figs., $2. Although this text deals with Indians in one state, it has considerably wider usefulness for study than the title might suggest. How the trained archaeologist proceeds to salvage every significant bit of historic evidence from a mound or village site is shown here, with precision and completeness; so that the work in one Illinois county might well serve as a working model for rediscovering other states. No less than six stages of Indian life are traced in Fulton county, carrying mound builders back into undated centuries, which tree ring chronology may some day fix in history.

*Science News Letter, April 24, 1937*

**Photography**

PHOTOGRAPHY, 1839 - 1937 — introduction by Beaumont Newhall—*Museum of Modern Art,* 225 p., plates, $3. Valuable historically and pictorially, this historical guide to a current exhibition has an excellent summary of nearly 100 years of photography. Professional photographers and those who merely enjoy will appreciate this book.

*Science News Letter, April 24, 1937*

**Archaeology**

PERUVIAN PAGEANT, A JOURNEY IN TIME—Blair Niles—*Bobbs-Merrill,* 311 p., plates, $3.50. Journeying in Peru, Mrs. Niles also adventures backward in time into the colorful, often amazing Indian civilizations that preceded Spanish conquest. Archaeology makes pleasant reading when thus blended with modern travel, and brought to life by a writer to whom Incas and even older Peruvians are as real as the modern people about her.

*Science News Letter, April 24, 1937*